Cost-Effectiveness of Different Models of Antiretroviral Treatment Delivery in South Africa: Methods

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Overview of Presentation

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Introduction

Background

- International and national targets for ART access require reaching different kinds of patients in diverse settings.
- Many different treatment delivery strategies will be needed.
- Cost per patient reached is likely to vary widely by regimen, setting, facility characteristics, and patient characteristics.
- Understanding the likely range of costs and the factors determining the cost-effectiveness of different models of treatment delivery is essential to planning, expansion, and sustainability.

Objectives of this Study

- What is the *average cost per successful patient outcome* of providing antiretroviral therapy to adult patients in South Africa under different models of treatment delivery?
- What are the main drivers of costs and why do costs differ among delivery models and sites?

Variables Expected to Influence Cost of Providing ART to Adults

- ART-related variables
  - Treatment protocol (drugs, diagnostics)
  - Drug prices (generic v. branded, negotiated prices)
  - Patient mix (% first and second line regimens)
- Facility-related variables
  - Scale (number of patients treated per site)
  - Scope (other services provided in addition to ART)
  - Setting (urban, peri-urban, rural)
  - Facility level and type (hospital, clinic, health post, mobile unit, physician's office)
  - Human resource strategy (doctors v. nurses)
  - Sector (government, NGO, private)

Variables Expected to Influence Effectiveness of Providing ART to Adults

- Facility-related variables
  - Treatment protocol (drugs, diagnostics)
  - Facility quality (experience, training, access to specialists, etc.)
  - Facility procedures (requirements for ART initiation, patient eligibility)
  - Level and type of adherence support
- Patient-related variables
  - Patient mix (starting CD4 counts, % naïve, age)
  - Patient characteristics (education, socioeconomic level, social support, distance from facility, etc.)

Methods

Basic Approach

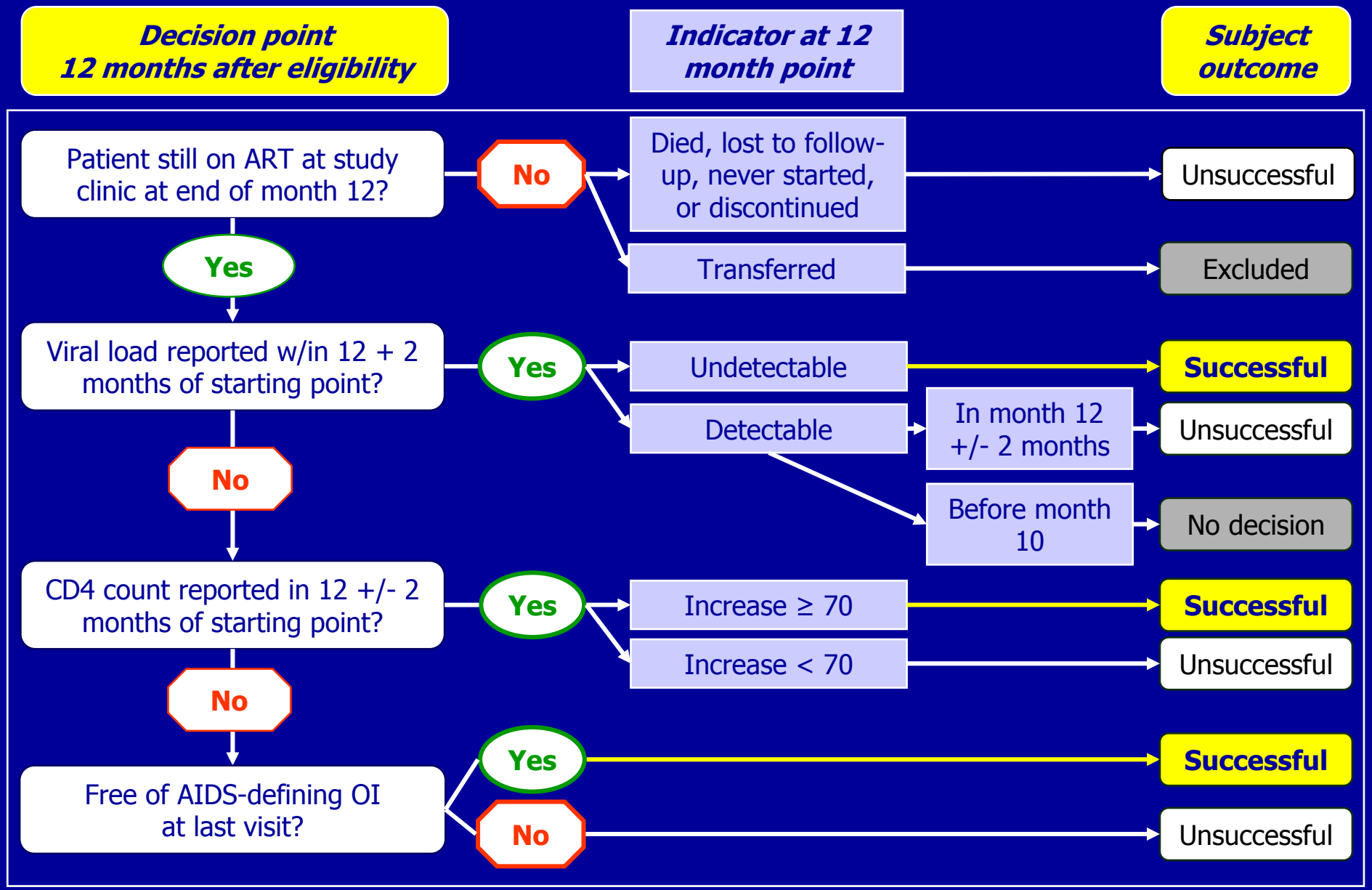
- Select ≈ 6 sites representing common or promising models of treatment delivery in South Africa.
- Enroll the first 100 patients at each site who became eligible for ART after January 1, 2005.
- Determine outcome of treatment for each subject 12 months after eligibility (successfully treated or not).
- Collect data from medical records on all resources used to treat study subjects for first 12 months after eligibility.
- Calculate cost of resources used.
- Estimate average "cost per successfully treated patient" for each site.

$$\text{Cost/ successfully treated patient} = \frac{\text{Sum of all costs incurred for sample of 100 patients over 12 months}}{\text{Number of successfully treated patients } (\leq 100)}$$

Definitions

- Starting point: medical eligibility for ART in SA (CD4 ≤ 200).
- Decision point: 12 months after medical eligibility.
- Successfully treated patient:
  - Undetectable viral load any time within 12+2 months of starting point; or
  - CD4 increase of 70 cells/μL at month 12 +/-2 months; or
  - No AIDS-defining OI at visit in month 12 +/- 2 months.
- Unsuccessfully treated patient:
  - Viral load still detectable at month 12 +/- 2 months; or
  - CD4 increase < 70 cells/ μL at month 12 +/- 2 months; or
  - AIDS-defining OI at visit in month 12 +/- 2 months; or
  - Never started ART or discontinued by end of month 12; or
  - Lost to follow-up by end of month 12; or
  - Died before end of month 12.
- Loss to follow-up: ≥ 3 months late for last scheduled doctor visit.
- Patients who transferred to another ART site are excluded.

Determination of Subject Outcomes



Costing 1: Variable Costs

- Variable costs are estimated per patient in the sample using individual medical record data.
- Variable costs include:
  - Drugs and labs used by sample and provided by study clinic (actual costs incurred by clinic).
  - Professionals' time (doctors, nurses, pharmacists, specialists) for each visit made by sample. (Cost = salary + benefits per month/average number of patients seen per month.)
  - Any other variable services and supplies provided by study clinic and used by sample (modified for each site).
- Time period for variable costs: ART eligibility to 12 months or last visit.
- Costs incurred prior to ART eligibility (including HIV test) are excluded.
- Costs of care not provided by study clinic and/or not reported on patient's medical record are omitted.

Costing 2: Fixed Costs

- Fixed costs are estimated for the clinic as a whole and divided by the number of active patients. (Pre-ART patients are multiplied by 2/7 to account for smaller number of scheduled clinic visits.)
- Fixed costs include:
  - Staff who provide clinic-wide services (e.g. managers, administrators).
  - Buildings and vehicles, including utilities, maintenance, insurance, etc.
  - Equipment, general supplies, communications.
  - Other fixed costs associated with providing ART.
- Time period for fixed costs: ART eligibility to 12 months or date of last scheduled visit.
- Fixed costs for subjects who died or were lost to follow-up are adjusted for number of months at study clinic.

Next Steps

- Complete analysis for confirmed sites:
  - Themba Lethu Clinic in Gauteng Province (large, public, urban hospital)
  - 2 rural NGO clinics in Mpumalanga Province (different models)
  - 1 private GP reimbursement scheme
- Identify and analyze 2-3 remaining sites:
  - Mobile clinic;
  - Public hospital with functioning down-referral clinics;
  - Public rollout site in low-resource area; and/or
  - Other interesting model of treatment delivery.
- Compare and evaluate results across sites.
- Study also includes a survey of costs incurred by patients at each study site; analyze these data.
- Evaluate larger sample and longer follow-up period for Themba Lethu Clinic.

Questions ...